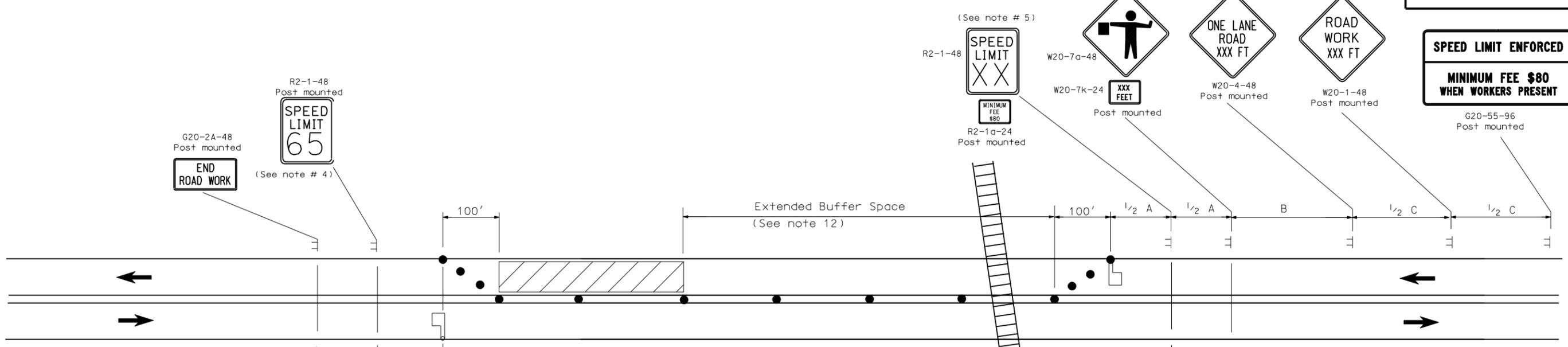
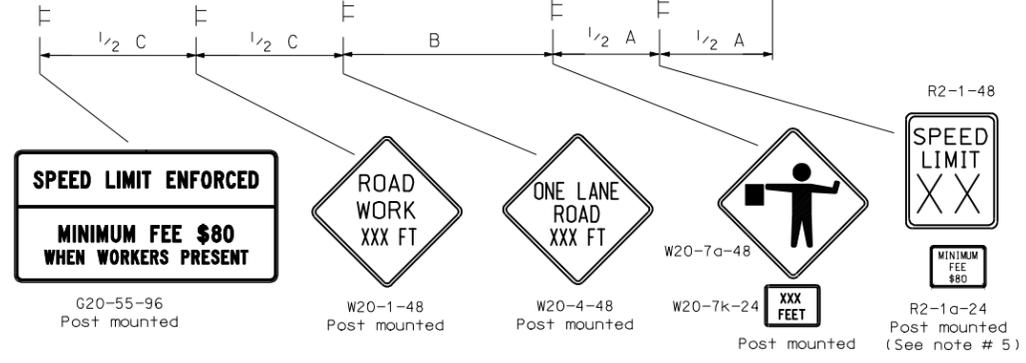


CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS

D-704-36



CONSTRUCTION SIGN LAYOUT
Two lane highway with one lane closed. Work in vicinity of highway-rail grade crossing.



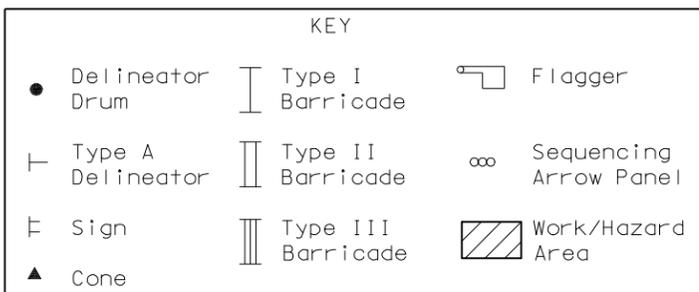
Longitudinal Buffer Space	
*Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

- Notes
- Variables
S = Numerical value of speed limit or 85th percentile.
W = The width of the taper.
L = Minimum length of taper, or $S \times W$ for freeways, expressways, and all other roads with speeds of 45 mph or greater, or $W \times S^2 / 60$ for urban, residential, and other streets with speeds of 40 mph or less.
 - Barricade shown to be placed on roadway shall be on a moveable assembly. Sign to be mounted on barricades shall be mounted with the sign on barricades shall be mounted with sign bottom on the top of the top barricade bar. Sign shown to be placed on the roadway shall be placed on moveable assemblies.
 - Delineator drums, used for tapering traffic shall be spaced at three equal spaces. Drums used for tangents shall be spaced at 2 times S.
 - The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
 - The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 mph. Where speed limits are to be reduced more than 30 mph, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 mph. The second speed limit sign shall be placed at $1/2$ B.
 - When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
 - Existing speed limit signs within a reduced speed zone shall be covered.
 - Obliterated or covered pavement shall be paid for as Obliteration of Pavement Marking. The covering shall be approved by the engineer.
 - Where necessary, safe speed to be determined by the Engineer.

- When highway-rail grade crossings exist either within or in the vicinity of roadway work activities, extra care should be taken to minimize the probability of conditions being created, either by lane restrictions, flagging or other operations, where vehicles might be stopped within the highway-rail grade crossing, considered as being 15 feet on either side of the closest and farthest rail. If the queuing of vehicles across active rail tracks cannot be avoided, a flagger shall be provided at the highway-rail grade crossing to prevent vehicles from stopping within the highway-rail grade crossing, even if automatic warning devices are in place.
- The contractor has the option of using portable sign supports in lieu of post mounted sign as shown on the standard drawings as specified in section 704.03 C.
- The buffer space should be extended upstream of the highway-rail grade crossing so that a queue created by the flagging operation will not extend across the highway-rail grade crossing.
- G20-55-96 signs are not required if this standard is part of other traffic control layouts.

* Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-99	
REVISIONS	
DATE	CHANGE
11-15-99	Add Taper Width to note
05-23-02	Rev notes & layout
07-19-02	Reversed End Road Work & Speed Limit Signs
07-25-03	Revised R2-1 and R2-1a
04-01-04	Rev. fee sign & warning & buffer sign spacing. Rev note 5, add note 12 & 13
12-01-04	PE Stamp added
02-16-05	Revised W20-7k sign size
06-29-05	Rev. Adv. warning table, Rev. note 5

This document was originally issued and sealed by Mark S Gaydos Registration Number PE-4518, on 06/29/05 and the original document is stored at the North Dakota Department of Transportation